HENEX Instrument Review Schedule

(From LLNL document provided by Perry Bell)

Conceptual Design Review on 12 December 2000:

The conceptual design review, a level 3 milestone, is where the diagnostic design will be reviewed by the Joint Central Diagnostic Team (JCDT) of the National Ignition Facility (NIF) or their nominees, and the NIF user community, and will consist of the following sections:
1) The performance specifications of the diagnostic
2) The top-level design of the diagnostic, including block level diagrams, and the location of the diagnostic on the target chamber
3) The schedule for the milestones
[M1) Conceptual design review (CDR), this milestone review]
M2) 65% design review
M3) 100% design review
M4a) Fabrication complete
M4b) Off-line acceptance tests complete
M5) Dry run review
M6) First use on NIF
M7) Functional operation
M8) Submission to NIF Operations for facility acceptance
M9) (Where appropriate) Decommissioning
4) The total cost and cost breakdown for each milestone, as procurements costs and effort in full time equivalents
5) The data analysis to be provided
Comments and concerns will be recorded, and must be addressed in the 65% design review.
The NIF JCDT or their nominees will accept or decline milestone completion within 5 working days of presentation.
Milestones 7 and 8 can only be changed through the diagnostic change control board.
To meet the milestone, the JCDT or their nominees must agree that:
1) The performance specifications of the diagnostic are acceptable
2) The top level design of the diagnostic, including block level diagrams, is acceptable
3) The schedule for the milestones is acceptable

65% Design Review on 4 May 2001:

The 65% design review is where the JCDT, the relevant expert group members and the NIF user community will review the diagnostic design. It includes all work necessary to control the final design of the diagnostic and will consist of the following sections:
1) Addressing comments of concern documented at the CDR review
2) Demonstration that the design meets performance specifications
3) A block diagram including all sub-sections of the diagnostic
4) Completion of CAD design models
5) Identification of the number of detail drawings needed to complete the diagnostic
6) Completion of product data sheets under configuration control
7) Identification of suppliers of major components
8) Cost estimates from vendors for vendor-built equipment
9) Identification of acceptance test requirements
10) Identification of calculation requirements (electrical circuit evaluation, structural response, shielding, etc.)
11) Identification of all control points and monitoring functions
12) Identification of interface requirements
13) Demonstration of conformation to NIF diagnostic-relevant guidelines
14) Estimated operation and maintenance costs and schedules
15) A discussion of failure modes
16) A description of the control, data retrieval and triggering systems
The 65% design documentation will serve as the roadmap for the 100% detail design. Comments of concern will be recorded, and addressed in the 100% design review.
The NIF JCDT or their nominees will accept or decline approval of milestone completion within 5 working days of presentation.

100% Design Review on 27 September 2001:

The 100% design review is where the JCDT or their nominees, the relevant expert group, and the NIF user community will review the final diagnostic design. It includes all work necessary to fabricate, assemble, offline test and field the final diagnostic and will consist of the following sections:

1) Addressing comments of concern documented at the 65% design review
2) Demonstration that drawing packages are complete down to the component and piece part level, including:

Detail drawings for individual components, checked for form, fit, function and capability to be manufactured
Electronic schematics and printed circuit board layouts
Cable layout details
All detail drawings must be approved by the diagnostic project engineer, and placed into configuration management system per the NIF diagnostic standards and guidelines

3) Identification of components

List of all components to be purchased
Bid estimates to support procurement of all components
Specifications written for all purchased components
Suppliers of components identified

4) Demonstration of the existence of detailed support calculations necessary to demonstrate that a sound design is completed (electrical circuit evaluation, structural response, shielding, etc.)
5) Provision of the interface documentation
6) Demonstration of conformation to NIF diagnostic standards and guidelines
7) Written preliminary assembly procedures
8) Written preliminary installation plan, including a discussion of safety aspects
9) Identification of preliminary acceptance test procedures
10) Written preliminary operational plans, including a discussion of safety aspects and impact on the facility.

The NIF JCDT or their nominees will accept or decline approval of milestone completion within 5 working days of presentation.

Fabrication and offline acceptance testing review:

The fabrication and offline acceptance testing review is where the JCDT or their nominees, the relevant expert group, and the NIF user community will review the fabrication and offline acceptance tests. It includes all work necessary to build and field the final diagnostic and test offline if applicable. The fabrication and offline acceptance testing review will consist of the following sections:
1) Addressing comments of concern from the 100% design review
2) Demonstration that procurements are completed
3) Demonstration that fabrication tasks are completed
4) Demonstration that components have been assembled
5) Demonstration that offline acceptance tests have been completed, specifically where appropriate on existing ICF facilities, to simulate as far as possible the expected conditions on the NIF
6) Demonstration that offline calibrations have been completed and documented
7) Production of written final assembly procedures
8) Demonstration that the final installation plan is complete
9) Demonstration that the preliminary acceptance test procedures have been written
10) Demonstration that the offline software integration is completed
11) Demonstration that software exists:
Control interface models
Software driver files complete
Source files are under configuration management within the NIF software configuration management system
12) An estimate of the expected reliability and/or availability when operated on the NIF, based on experimental results
Comments of concern will be recorded, and addressed in the dry run review.
The NIF JCDT or their nominees will accept or decline approval of milestone completion within 5 working days of presentation.

Dry run review:

The dry run review will present to the JCDT or their nominees, the relevant expert group, and the NIF User community, the results of the dry run testing on the NIF target chamber and will consist of the following sections:
1) Addressing comments of concern documented at the fabrication and offline acceptance testing
2) Demonstration that system integration is completed
Diagnostic equipment installed
Cabling installation completed
Diagnostic controller is integrated to the target area Front End Processor (FEP)
3) Demonstration that the Data Accusation System (DAS) is functional
Control points testing for the diagnostic have been completed.
Operation of the diagnostic has been verified
Communication with the DAS has been verified
Data collection has been verified
4) Production of a written preliminary operation and maintenance plans, including safely
5) Production of written preliminary software manuals
6) Production of written final acceptance test requirements
7) Production of the written offline acceptance tests review
The NIF JCDT will accept or decline approval of milestone completion within 5 working days of presentation.

First use on NIF:

At this point the diagnostic has completed initial testing and is ready to be used to collect data on target shots as a tertiary or secondary diagnostic.

Functional operation:

The functional operation review shall consist of the following sections, presented to the JCDT or their nominees, the relevant expert group, and the NIF Operations group:
1) A presentation of the diagnostic performance including data
2) Demonstration that the responsible individual (RI) has verified diagnostic operation on target shots
3) Demonstration that the diagnostic is reliable and can be used as a primary diagnostic on experiments (i.e. a diagnostic without which a shot will be cancelled)
4) Initiation of training of the operations staff by the design and development staff
5) Operation and support of the diagnostic at this time is still provided by the organization responsible for its design and development

Submission to NIF operations for facility acceptance:

The Facility Acceptance Review is presented to the NIF Operations group, and the relevant expert group. The presentation must demonstrate that the diagnostic has completed operational testing and is suitable to be considered as a facility diagnostic. The presentation will demonstration that the Facility Acceptance Criteria (see separate document, “The Facility Acceptance Criteria for the Diagnostics on the National Ignition Facility”) have been met.